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ABSTRACT

Individualized reading test materials were developed containing gender-neutral, male-only, or female-only referents in a study to determine whether undue reference to one sex had a differential effect on the test scores of male or female students. One hundred twenty randomly selected third grade students were first tested on the gender-neutral test. One week later, one half of the students were given tests containing only female referents, and the other half were given tests containing only male referents. A significant difference was found between neuter-and gender-specific test scores, with both males and females making higher scores on the male-only referent test than on the neuter referent test. The lack of a significant interaction between test content and test performance by sex suggests that male and female content does not differentially affect male or female test performance. (FL)

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The Interaction Between Sex Referents in Test Items and Reading Performance on Individualized Reading Tests

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Education is highly dependent on its assessment measures. Studies indicate that teachers tend to view tests as fairly accurate measures of students' ability and believe that considerable weight should be given to test results (Goslin, 1957). There is also some evidence to show that 80% of school students believe that assessment tests are somewhat accurate (Kirkland, 1971).

Test effects are most potent on those being tested. Individual status in school and society is often determined by test scores and their self-image, motivation and aspiration are also influenced. The Joint Committee on testing leveled several criticisms at testing in general including the problems that finality is too often attached to test scores and that inaccurate testing can foster a narrow conception of ability (Kirkland, 1971).

The use of all types of tests has been under attack for the past few decades. One question raised in regard to tests concerns the types of items that are used to elicit the skills being examined. It has been conjectured that test content that reflects one group may favor members of that group and may be detrimental to the performance of others (Schmeiser and Ferguson, 1978; Jensen, 1976.) If a test results in negative outcomes for a person because that person is a member of group not reflected in the test items, this could be an indication of test bias. A test can be considered biased or unfair if the scores are consistently too high or too low for members of the group that is not reflected in the test items. All persons who are being tested should be given an equal chance of being successful--regardless of group membership (Linn, 1973).

One group of issues raised in regard to test content is composed of the following types of questions: "What were the relative proportions of males and females portrayed in the test items? What was the relative status of females and males portrayed in the items? Were the males and females depicted only in traditional roles? What was the range of roles in which females and males were

portrayed? (Dwyer, 1976).

Educators and others have become aware of the inequitable presentation of the sexes in tests and other curriculum materials. Content analyses of standardized achievement tests (Donlon, 1973; Tittle, McCarthy and Steckler, 1974; and Lockheed-Katz, 1974); vocational interest tests (Tittle et al., 1974; Boyd, 1975; and Gottfredson, 1976), and individualized reading tests (Rowell, 1978) indicate that the language of most tests is male oriented.

Several writers have discussed the general male orientation of the English language and what appears to be the sex-typed use of language in all types of curriculum materials (Key, 1972; Tiedt, 1973; Malcolm, 1971; Smith, 1973.) Although it has been considered grammatically correct to use masculine referents to stand for non-specific persons, recent studies have revealed that children interpret language quite literally. When children see the male pronoun used as a generic term, they generally consider the pronoun to refer to a male character and not as a neutral representative of all persons (Kidd, 1971).

One criticism that has been raised in regard to the male orientation of tests is that the use of such words as he rather than she, men rather than people, salesmen rather than salesperson adversely affects the scores of females. The American Personnel and Guidance Association, The Association for Measurement and Evaluation in Guidance, The American Psycchological Association, and the National Institute of Education have devoted considerable attention to defining practices for sex-fair measurements. There is general agreement within these groups that gender-neutral item wording might consitute a desirable practice but there is some disagreement on whether making these changes will make enough difference in the outcomes to be worthwhile (Datta, 1977).

It is not clear whether bias results in different or incorrect scores for members of the group not equally represented. Studies in which sexist referents

such as fireman and salesman were eliminated from vocational interest inventories found that the altering of content made no difference (Boyd, 1976; Gottfredson, 1976). However, it could be conjectured that the career choices of the subjects tested had already been made and changes to eliminate such terms as fireman and salesman would not radically modify the original vocational aspirations. No research has been reported which explores the implications of this unequal representation in achievement and diagnostic tests including individualized reading tests.

(Insert Table 1)

Table 1

Ratios of All and Regular Male Noun and Pronoun Referents to Female Noun and Prnoun Referents in Three Individualized Reading Tests

Test	All Referents Nouns-Pronouns nM/nF=Ratio		Regular Referents Nouns-Pronouns nM/nF=Ratio		All Pronouns nM/nF=Ratio		Regular Pronouns nM/nF=Ratio		Proper Nouns nM/nF=Ratio		All Common Nouns nM/nF=Ratio		Regular Common Nouns nM/nF=Ratio	
Classroom Reading Inv.														
Form A	24/2	12.00	23/2	11.50	3/0	-	3/0	-	11/1	11.00	10/1	10.00	9/1	9.00
Form B	50/4	12.50	42/4	10.50	20/0	-	13/0	-	20/2	10.00	10/2	5.00	9/2	4.50
Form C	20/2	10.00	16/2	8.00	4/0	-	1/0	-	13/1	13.00	3/1	3.00	2/1	2.00
Total	94/8	11.75	81/8	10.12	27/0	-	17/0	-	44/4	11.00	23/4	5.75	20/4	5.00
Diagnostic Reading Scales														
Form A & C	104/23	4.53	95/23	4.13	58/16	3.62	49/16	3.06	34/6	5.67	12/2	6.00	12/2	6.00
Form B & D	44/32	1.38	38/32	1.19	20/23	.87	14/23	0.61	11/8	1.38	13/1	13.00	13/1	13.00
Total	148/55	2.69	133/55	2.41	78/39	2.00	63/39	1.61	45/14	3.21	25/3	8.33	25/3	8.33
Durrell Analysis of Reading Difficulty														
Oral	28/6	4.67	28/6	4.67	12/3	4.00	12/3	4.00	7/2	3.50	9/1	9.00	9/1	9.00
Silent	16/18	.89	16/18	.89	7/7	1.00	7/7	1.00	2/0	-	7/11	.64	7/11	.64
Listening	38/4	9.50	38/4	9.50	17/4	4.25	17/4	4.25	10/0	-	10/0	-	10/0	-
Supplementary	42/0	-	40/0	-	24/0	-	24/0	-	10/0	-	8/0	-	6/0	-
Total	124/28	4.43	122/28	4.36	60/14	4.28	60/14	4.28	29/2	14.50	34/12	2.83	32/12	2.67

TABLE 2

Comparison of Ratios of All Male Noun and Pronoun Referents to All Female Noun and Pronoun Referents in 2nd and 3rd Editions of the Classroom Reading Inventory

	2nd Edition		3rd Edition	
	nM/nF	Ratio	nM/nF	Ratio
Form A	24/2	12.00	22/18	1.22
Form B	50/4	12.50	50/4	12.50
Form C	20/2	10.00	20/2	10.00
	94/18	11.75	92/24	3.83

Reading is one of the basic areas of the school curriculum and individualized reading tests are widely used to evaluate students' progress and place them in groups and materials. However three widely used individualized reading tests, the Durrell Analysis of Reading Difficulties (Durrell, 1955), the Classroom Reading Inventory (Silvaroli, 1965) and the Diagnostic Reading Scales (Spache, 1972) contain many more referents to males than to females as shown in Table 1 (Rowell, 1978). Although many tests have been revised in recent years to eliminate sexist wording no significant changes have been made in these frequently used individualized reading tests. The new revision of the Classroom Reading Inventory (1976) contained such a change in only one passage as shown in Table 2.

In the past it has been argued that it did not matter if individualized reading tests that are frequently used to diagnose students with reading difficulties contained primarily male referents as it has been a general research finding that girls are generally better readers than boys. Girls (in the United States) characteristically learn to read earlier, achieve higher scores on standardized reading tests and account for a lower percentage of pupils referred for

diagnostic testing and remedial reading than do boys (Dwyer,73). In the past boys made up to 75 to 80 percent of the disabled readers (Zimet, 1976). However, today we are identifying an increasing number of girls who have reading problems (Nelson, 1976) and an effort needs to be made to determine whether undue reference to one sex or another has negative effects on their performance. As reading is one of the basic areas of the school curriculum an investigation should be made made to attempt to determine if changes in sex referents would have substantial effects on performance on measures such as individualized reading tests.

The question of whether or not an undue reference to one sex has a differential effect on individualized reading test scores of males and females is addressed in this study. That is do males and females score differently on test items which contain only male or only female referents?

STRUCTURE OF THE STUDY

The Sample

The population consisted of a total of 120 randomly selected second semester third graders from six different urban, suburban and rural schools. An attempt was made to select a higher and a lower socio-economic level school in each area. Half of the examinees in each location were male and half were female.

Procedures

Each student was initially tested to determine an instructional level on the same form of a gender-neutral test containing no male or female referents. Within a one week period each student was also administered an alternate form of the test of similar readability but containing either all male or all female referents. One half of the boys and one half of the girls were given a test containing only male referents, the remainder were given a test containing only female referents.

The two tests were administered individually to each student by a trained examiner. Each student was asked to read selections orally starting with the selection for the eighth month of the first grade (1.8). When the student had finished reading each selection, he/she was asked questions to measure his/her comprehension. When the student failed to pass a selection based on the Spache criteria that takes into consideration both word recognition and comprehension errors, testing ceased.

The differences between the gender-neutral and gender-specific tests (all male or all female referents) were the main factors analyzed. As all individualized reading tests of this type relate scores in grade equivalents, the analysis of data was confined to grade equivalent scores

Instruments

The gender neutral and gender specific tests were patterned after the Diagnostic Reading Scales because this test is widely used and the correlation coefficients of the equivalent forms at the instructional level are high, .99 (Spache, 1972). All changes made to develop the gender neutral and all male and all female tests did not change the original readability of the selections as determined by the Spache and Dale-Chall readability formulas.

The gender neutral test contained no male or female referents. The subjects of each topic of the passages in the gender neutral test are given in List 1.

LIST 1

Levels and Subjects of Each Passage in the Gender-Neutral Test

Grade Level	Subjects
1.6	Children playing with Red, the bird.
1.8	Children feeding the bird.
2.3	Children watching a fire.
2.8	Children playing while awaiting arrival of a pony.
3.3	Children watching a parade.
3.8	Children at a circus watching clowns, elephants, zebras.
4.5	Children on a nature walk with the teacher looking at plants, bees, birds.
5.5	Flowers in a garden.
6.5	Mastodons
7.5	Marble and granite

In the tests containing male only or female only selections, the settings and actions for the male and female characters were identical. The only changes were to substitute male and female referents e.g. "One day Bob took a trip to the zoo" was changed to "One day Mary took a trip to the zoo." The principal subjects of each of the passages in the male only or female only test are given in List 2.

List 2

Levels and Principal Subjects of Each Passage in the Male Only or Female Only Gender Specific Tests

Level	Only Male Referents	Only Female Referents
1.6	Bob - on his way to school.	Mary - on her way to school.
1.8	Farmer (he) taking care of horse (he)	Farmer (she) taking care of cow (she)
2.3	Bob, playing with dog (he)	Mary, playing with dog (she)
2.8	Bob on way to school nearly hit by car (male)	Mary on way to school nearly hit by car (female driver)
3,3	Bob going for walk with male dog, Spotty (he)	Mary going for walk with female dog, Spotty (she)
3.8	Bob visiting zoo.	Mary visiting zoo.
4.5	Bob visiting city market. Men selling fruit.	Mary visiting city market. Women selling fruit.
5.5	John Paul, travelling and doing chores on a ship - brother, man	Jean Ann, Travelling and doing chores on a ship - sister, women
6.5	Early settlers	Early settlers
7.5	Good reader - (he)	Good reader (she)

Findings

The gender-neutral test was administered to detect any initial differences for the males and females in reading level. Analysis of the means of the male and female scores on the gender-neutral test produced an $F=0.02$ ($p>.05$, 1, 118 df). This F is not large enough to claim statistical significance and it was concluded that the males and females included in the study did not appear to differ significantly on initial reading levels.

Table 3 presents the mean scores and standard deviations of the subjects given the gender-neutral, male and female tests separated by sex of the subject. The magnitude of the means indicates a level of reading performance equivalent to the end of the third grade according the norms on the Spache test.

TABLE 3

MEANS AND STANDARD DEVIATIONS ON THE GENDER-NEUTRAL AND GENDER SPECIFIC TESTS GIVEN TO SUBJECTS

SEX	SAME SEX TEST		OPPOSITE SEX TEST	
	Gender Neutral Test	Male Test	Gender Neutral Test	Female Test
Males	$\bar{X}$=4.0	$\bar{X}$=4.5	$\bar{X}$=3.4	$\bar{X}$=3.9
N=60	S=1.57	S=1.38	S=1.37	S=1.30
	N=30	N=30	N=30	N=30
	Neutral Test	Female Test	Neutral Test	Male Test
Females	$\bar{X}$=3.6	$\bar{X}$=3.9	$\bar{X}$=3.7	$\bar{X}$=4.1
N=60	S=1.29	S=1.21	S=1.19	S=1.25
	N=30	N=30	N=30	N=30

Students did significantly better on the test with sex specific referents than they did on the test with gender-neutral referents. As the gender-neutral and gender-specific tests were given within a one week period and contained completely different items, it is doubtful that this finding was due to either the repeated testing or to instructional gains. This may reflect the effect of increased comprehension and thus higher achievement on the tests when the subjects were given passages with referents of either sex rather than gender-neutral referents. The hypothesis of no difference in test scores when subjects were given gender-netural tests and gender-specific tests was therefore rejected, ($F=30.16$, $p < .001$, $dr=1/116$).

An analysis of the differences in scores between the gender-neutral and the all-male and all-female gender specific reading tests separated for males and females is presented in Table 4.

TABLE 4

TEST OF THE SIGNIFICANCE OF THE DIFFERENCE SCORES BETWEEN GENDER-NEUTRAL AND GENDER-SPECIFIC READING TESTS

SEX	DIFFERENCE	
	Neutral-Male	Neutral-Female
	$\bar{X}$=0.59	$\bar{X}$=0.58
Males	S=0.77	S=0.67
	t=4.17*	t=4.80*
	Neutral-Female	Neutral-Male
	$\bar{X}$=0.33	$\bar{X}$=0.13
Females	S=0.93	S=0.84
	t=1.90	t=2.17*

Males made significant gains on both gender-specific tests compared to the gender-neutral test whereas females made significant gains on the opposite sex test but not on the same sex test. Both groups made significantly higher scores on the male test than on the gender-neutral test. That is, males seemed to do better on the test where the sex referents of the items matched their sex and the females seemed to do better where the sex referents did not match their sex. It is unlikely that this difference is due to the one week intervention between tests or to abnormally high scores on the neuter test. The practice effect is balanced for males and females as there was no difference between males and females on the gender-neutral tests (t=0.14, df=118). The male and female tests were identical except for the inclusion of all male or all female referents so the interest factor was balanced. This analysis may signify a differential reaction to male and female item referents, The hypothesis of no significant difference in

reading test scores with the same or opposite sex referents was therefore rejected.

Conclusions

The results of this study found a significant difference between the scores on the gender-neutral and gender-specific tests. Subjects did significantly better on the tests with sex specific referents than they did on the tests with gender-neutral referents. It appears that both boys and girls prefer to read items containing reference to one sex or the other than items containing gender-neutral referents.

One of the major findings of the study was that although the boys did significantly better on both retests, the girls did not do significantly better on the test containing female referents. The cause of this finding should be explored. This may be because males and females are so accustomed to male referents that the presence of female items was an interferent because both males and females did better on the male items. Another factor to be considered is the possibility that third grade girls might like to read about boys because they are interested in boys but third grade boys may not have yet reached this developmental stage.

The effects of sex referents in test items has implications for test publishers as well as for teachers and researchers. It is hoped that other researchers will study this issue so that the question of the possible effects of sex referents on measurement can be decided by reference to emperical data.

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